

## DISCUSSION

### Discussion of the paper ‘Multi-criteria optimal structural design under uncertainty’ by J. Beck, E. Chan, A. Irfanoglu and C. Papadimitriou<sup>1</sup>

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The discussers are very much interested in the present paper by Professor Beck *et al.* and agree with the authors on the point that this new research area is important in the enhancement of structural reliability under uncertainty. This paper includes various interesting aspects, e.g. multi-criteria optimal structural design, reliability-based design criteria, decision under uncertainty and aggregation of preference functions. Many of these aspects were incorporated by the discussers in a computer-aided structural design system in the middle 1980s and early 1990s [2–7]. Elastic–plastic response was also considered directly in that system in contrast to the present paper.

It seems to the discussers that a method [2–7] using ‘dissatisfaction functions’ [8, 9] is more suitable for the unified representation of objective functions and constraints than the present method using the aggregation of preference functions with lower bounds (upper bounds in dissatisfaction functions). It appears difficult to indicate the level of violation of constraints and the level of satisfaction of objectives with the present preference functions.

In closing the discussers would like to call the attention of interested readers to the work reported in References [2–7] to provide a broader context in which to place the methodology and results reported by Beck *et al.* [1].

## REFERENCES

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